



# SEQUENCE LISTING

<110> Gordon-Kamm, William J.  
Lowe, Keith S.  
Larkins, Brian A.  
Dilkes, Brian R.  
Sun, Yuejin

<120> Cell Cycle Nucleic Acids, Polypeptides and Uses Thereof

<130> 1146

<140> 09/993,808

<141> 2001-11-06

<150> 60/246,349

<151> 2000-11-07

<160> 6

<170> PatentIn version 3.1

<210> 1

<211> 1372

<212> DNA

<213> Zea mays

<220>

<221> CDS

<222> (134) .. (904)

<223>

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gggagaggaa aaagagaaag aggaaccggc caagacaagc aagcgagagg ccagggccgc 120  
ggcgttgctg cag atg ggg aag tac atg cgc aag tgc agg ggc gcc gca 169  
Met Gly Lys Tyr Met Arg Lys Cys Arg Gly Ala Ala  
1 5 10  
ggc gcg gag gtc gcc gcc gtc gag gtt acg cag gtc gtc ggc gtc cgg 217  
Gly Ala Glu Val Ala Ala Val Glu Val Thr Gln Val Val Gly Val Arg  
15 20 25  
acg agg tcc agg tcc gcg gcg gcg acc ggc ggt gtc gcg aag gtc gcc 265  
Thr Arg Ser Arg Ser Ala Ala Ala Thr Gly Gly Val Ala Lys Val Ala  
30 35 40  
ccg agg agg aag agg gcg ccg gcg ggg gag cct gct gcc gcc gtg agc 313  
Pro Arg Arg Lys Arg Ala Pro Ala Gly Glu Pro Ala Ala Ala Val Ser  
45 50 55 60  
gct ggt ggg gac ggc gga agc tgc tac atc cac ctg cgt agc cgc atg 361  
Ala Gly Gly Asp Gly Gly Ser Cys Tyr Ile His Leu Arg Ser Arg Met  
65 70 75

ctg ttc atg gca ccg cct cag ccg cag ccg tcg gtt gac tcg gtt ccg Leu Phe Met Ala Pro Pro Gln Pro Gln Pro Ser Val Asp Ser Val Pro	409
80 85 90	
acc ccg gtg gag gct gct gat ggc gct gca gga cag cag ggc gcg gcg Thr Pro Val Glu Ala Ala Asp Gly Ala Ala Gly Gln Gln Gly Ala Ala	457
95 100 105	
ctc gcg gcc ggg ctc tcg cgt tgc tcc agc acg gcg tcg tcg gtg aac Leu Ala Ala Gly Leu Ser Arg Cys Ser Ser Thr Ala Ser Ser Val Asn	505
110 115 120	
ttg ggc ttg ggg ggt cag cgc ggg agc cac acc tgc cgc tcc tac gac Leu Gly Leu Gly Gly Gln Arg Gly Ser His Thr Cys Arg Ser Tyr Asp	553
125 130 135 140	
gct gca gag gct ggc ggg gat cac gtc ctg gtg gat gtc tcg gcg gcg Ala Ala Glu Ala Gly Gly Asp His Val Leu Val Asp Val Ser Ala Ala	601
145 150 155	
agc aac tcc ggg agc ggc cca gac cgc gag agg cga gag acg acg cca Ser Asn Ser Gly Ser Gly Pro Asp Arg Glu Arg Arg Glu Thr Thr Pro	649
160 165 170	
tcg agc cgg gcg cac ggc gag ctc agc gat ctg gag tcg gat ctg gcg Ser Ser Arg Ala His Gly Glu Leu Ser Asp Leu Glu Ser Asp Leu Ala	697
175 180 185	
ggg cac aag act ggc ccg tcg cta ccg gcg gca acg ccg gct gcg gag Gly His Lys Thr Gly Pro Ser Leu Pro Ala Ala Thr Pro Ala Ala Glu	745
190 195 200	
ctg atc gtg ccg cca gca cac gag atc cag gag ttc ttc gcc gcc gcc Leu Ile Val Pro Pro Ala His Glu Ile Gln Glu Phe Phe Ala Ala Ala	793
205 210 215 220	
gag gcg gcc cag gcc aag cgc ttt gct tcc aag tac aac ttc gac ttc Glu Ala Ala Gln Ala Lys Arg Phe Ala Ser Lys Tyr Asn Phe Asp Phe	841
225 230 235	
gtc cgc ggc gtg ccc ctc gac gcc ggc ggc cgg ttc gag tgg gcg ccg Val Arg Gly Val Pro Leu Asp Ala Gly Gly Arg Phe Glu Trp Ala Pro	889
240 245 250	
gtg gtc agc atc tga agcgagcgtg cgtccggtgc aaggtgaagc tagaaagaga Val Val Ser Ile	944
255	
aaagatgcc cccccccccc cccccaacaa acataacgga gaagagaaaa accaaacaat	1004
taagcagctt tatatagcct aagctaacca ccaccattca tctcgtccaa atgcatgcct	1064
tgctttttctc tggagctagc aggagcgtag ttattatttta gtactacttt acttattcag	1124
aggttatctt gaccccgata gatcaatccg cttactgtgt aattttctctc atgcatctct	1184
tagatggagt ttaatcgtct taatttatta ctgtacagca gcttgsttgg cttgcaaaga	1244

aagatctggt ttgtctcaaa aaaaaaaaaa aaaaaaaaaa aaaaagggcg gccgctctag 1304  
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 attcattc 1372

<210> 2  
 <211> 256  
 <212> PRT  
 <213> Zea mays

<400> 2

Met Gly Lys Tyr Met Arg Lys Cys Arg Gly Ala Ala Gly Ala Glu Val  
 1 5 10 15

Ala Ala Val Glu Val Thr Gln Val Val Gly Val Arg Thr Arg Ser Arg  
 20 25 30

Ser Ala Ala Ala Thr Gly Gly Val Ala Lys Val Ala Pro Arg Arg Lys  
 35 40 45

Arg Ala Pro Ala Gly Glu Pro Ala Ala Ala Val Ser Ala Gly Gly Asp  
 50 55 60

Gly Gly Ser Cys Tyr Ile His Leu Arg Ser Arg Met Leu Phe Met Ala  
 65 70 75 80

Pro Pro Gln Pro Gln Pro Ser Val Asp Ser Val Pro Thr Pro Val Glu  
 85 90 95

Ala Ala Asp Gly Ala Ala Gly Gln Gln Gly Ala Ala Leu Ala Ala Gly  
 100 105 110

Leu Ser Arg Cys Ser Ser Thr Ala Ser Ser Val Asn Leu Gly Leu Gly  
 115 120 125

Gly Gln Arg Gly Ser His Thr Cys Arg Ser Tyr Asp Ala Ala Glu Ala  
 130 135 140

Gly Gly Asp His Val Leu Val Asp Val Ser Ala Ala Ser Asn Ser Gly  
 145 150 155 160

Ser Gly Pro Asp Arg Glu Arg Arg Glu Thr Thr Pro Ser Ser Arg Ala  
 165 170 175

His Gly Glu Leu Ser Asp Leu Glu Ser Asp Leu Ala Gly His Lys Thr  
180 185 190

Gly Pro Ser Leu Pro Ala Ala Thr Pro Ala Ala Glu Leu Ile Val Pro  
195 200 205

Pro Ala His Glu Ile Gln Glu Phe Phe Ala Ala Ala Glu Ala Ala Gln  
210 215 220

Ala Lys Arg Phe Ala Ser Lys Tyr Asn Phe Asp Phe Val Arg Gly Val  
225 230 235 240

Pro Leu Asp Ala Gly Gly Arg Phe Glu Trp Ala Pro Val Val Ser Ile  
245 250 255

<210> 3  
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<212> DNA  
<213> Zea mays

<220>  
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<222> (154) .. (726)  
<223>

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tctcctggcc tctgccgccc cgtcgcacag aatcgcttgg tgcaccctgc gagggcctcc 120  
tcgaaaccct agcttgccca gcccctccgg gcc atg ggc aag tac atg cgc aag 174  
Met Gly Lys Tyr Met Arg Lys  
1 5  
gcc aag gct tcc agc gag gtt gtc atc atg gat gtc gcc gcc gct ccg 222  
Ala Lys Ala Ser Ser Glu Val Val Ile Met Asp Val Ala Ala Ala Pro  
10 15 20  
ctc gga gtc cgc acc cga gcg cgc gcc ctc gcg ctg cag cgt ctg cag 270  
Leu Gly Val Arg Thr Arg Ala Arg Ala Leu Ala Leu Gln Arg Leu Gln  
25 30 35  
gag cag cag acg cag tgg gag gaa ggt gct ggc ggc gag tac ctg gag 318  
Glu Gln Gln Thr Gln Trp Glu Glu Gly Ala Gly Gly Glu Tyr Leu Glu  
40 45 50 55  
cta agg aac cgg agg ctc gag aag ctg ccg ccg ccg ccg gcg acc acg 366  
Leu Arg Asn Arg Arg Leu Glu Lys Leu Pro Pro Pro Pro Ala Thr Thr  
60 65 70  
agg agg tcg ggc ggg agg aaa gcg gca gcc gag gcc gcc gca act aag 414  
Arg Arg Ser Gly Gly Arg Lys Ala Ala Glu Ala Ala Ala Thr Lys

75	80	85	
gag gct gag gcg tcg tac ggg gag aac atg ctc gag ttg gag gcc atg			462
Glu Ala Glu Ala Ser Tyr Gly Glu Asn Met Leu Glu Leu Glu Ala Met			
90	95	100	
gag agg att acc agg gag acg acg cct tgc agc ttg att aac acc cag			510
Glu Arg Ile Thr Arg Glu Thr Thr Pro Cys Ser Leu Ile Asn Thr Gln			
105	110	115	
atg act agc act cct ggg tcc acg aga tcc agc cac tct tgc cac cgc			558
Met Thr Ser Thr Pro Gly Ser Thr Arg Ser Ser His Ser Cys His Arg			
120	125	130	135
agg gtg aac gct cct ccg gtg cac gcc gtc cca agt tcg agg gag atg			606
Arg Val Asn Ala Pro Pro Val His Ala Val Pro Ser Ser Arg Glu Met			
140	145	150	
aat gag tac ttc gct gcc gaa cag cga cgc caa caa cag gat ttc att			654
Asn Glu Tyr Phe Ala Ala Glu Gln Arg Arg Gln Gln Gln Asp Phe Ile			
155	160	165	
gac aag tac aac ttc gat cct gca aac gac tgc cct ctc cca ggc agg			702
Asp Lys Tyr Asn Phe Asp Pro Ala Asn Asp Cys Pro Leu Pro Gly Arg			
170	175	180	
ttt gag tgg gtg aag cta gac tga tggattcaga gggacgagag agcagcaggc			756
Phe Glu Trp Val Lys Leu Asp			
185	190		
atggaatgga atggaactca cccccgctc cctccacacc accccagcgt tgtggcagag			816
gcgcataccg tcgtgttagc ttcgtttctg ctgtaaaaaa aaacttagtg ttttagcatg			876
tagccttaat tggtcgtgtg ttacagtaca gaactgatgc tgagttacaa caccctgatc			936
tgggtcttgat ctgatccctc aactccaatg taacccttaa cagctcattc tgtaaggaac			996
ctgtcaccct gttacctggt gctgaactaa tgaagtagag ctagataatg acgtttttatc			1056
gtagttaaaa aaaaaaaaaa aaagggcggc cgc			1089

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 <211> 190  
 <212> PRT  
 <213> Zea mays

<400> 4

Met Gly Lys Tyr Met Arg Lys Ala Lys Ala Ser Ser Glu Val Val Ile
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Met Asp Val Ala Ala Ala Pro Leu Gly Val Arg Thr Arg Ala Arg Ala
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Leu Ala Leu Gln Arg Leu Gln Glu Gln Gln Thr Gln Trp Glu Glu Gly  
35 40 45

Ala Gly Gly Glu Tyr Leu Glu Leu Arg Asn Arg Arg Leu Glu Lys Leu  
50 55 60

Pro Pro Pro Pro Ala Thr Thr Arg Arg Ser Gly Gly Arg Lys Ala Ala  
65 70 75 80

Ala Glu Ala Ala Ala Thr Lys Glu Ala Glu Ala Ser Tyr Gly Glu Asn  
85 90 95

Met Leu Glu Leu Glu Ala Met Glu Arg Ile Thr Arg Glu Thr Thr Pro  
100 105 110

Cys Ser Leu Ile Asn Thr Gln Met Thr Ser Thr Pro Gly Ser Thr Arg  
115 120 125

Ser Ser His Ser Cys His Arg Arg Val Asn Ala Pro Pro Val His Ala  
130 135 140

Val Pro Ser Ser Arg Glu Met Asn Glu Tyr Phe Ala Ala Glu Gln Arg  
145 150 155 160

Arg Gln Gln Gln Asp Phe Ile Asp Lys Tyr Asn Phe Asp Pro Ala Asn  
165 170 175

Asp Cys Pro Leu Pro Gly Arg Phe Glu Trp Val Lys Leu Asp  
180 185 190

<210> 5  
<211> 841  
<212> DNA  
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<220>  
<221> CDS  
<222> (159)..(839)  
<223> The 'r' at location 491 stands for g or a.

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aggcgtggga gtggccgagt gggagtggga gtgaaaaaga ggaaccggcc aagagaagca 120  
agcgagaaga aggcagtgct gcggcggcgt tccgtaag atg ggg aag tac atg cgc 176  
Met Gly Lys Tyr Met Arg

	1	5			
aag cgc agg ggg gcc gcg ggc gag ggg gtg gcc gca gtc gag gtc tcg Lys Arg Arg Gly Ala Ala Gly Glu Gly Val Ala Ala Val Glu Val Ser	10	15	20	224	
cag gtc gtc ggc gtc cgg acg agg tcc agg tcc gcg gcg gcg acc ggc Gln Val Val Gly Val Arg Thr Arg Ser Arg Ser Ala Ala Ala Thr Gly	25	30	35	272	
ggc ggt gtc gcg aag gtc gct ccg ccg agg agg aag aag gcg ctg ctg Gly Gly Val Ala Lys Val Ala Pro Pro Arg Arg Lys Lys Ala Leu Leu	40	45	50	320	
ccc gcc gcg aac gtg acg acg tcg ggg gag cct ggt gcc gtg ggc gct Pro Ala Ala Asn Val Thr Thr Ser Gly Glu Pro Gly Ala Val Gly Ala	55	60	65	70	368
ggt ggt ggg gac ggc gga agc tgc tgc tac atc cac ctg cgg agc cgc Gly Gly Gly Asp Gly Gly Ser Cys Cys Tyr Ile His Leu Arg Ser Arg	75	80	85	416	
atg ctg ttc atg gca gca cct cag cag caa ccg tcg gcg gct ctg acg Met Leu Phe Met Ala Ala Pro Gln Gln Gln Pro Ser Ala Ala Leu Thr	90	95	100	464	
ccg gtg gag gct gct ggt gcg gca car caa ggc ggg gtg gtg gcg ctc Pro Val Glu Ala Ala Gly Ala Ala Xaa Gln Gly Gly Val Val Ala Leu	105	110	115	512	
gcg gct ggc ctc tcg cgt tgc tcc agc acg gcg tcg tcg gtg gac gtc Ala Ala Gly Leu Ser Arg Cys Ser Ser Thr Ala Ser Ser Val Asp Val	120	125	130	560	
ggg ggc cac gcc tgc cgc tcc gac gct gcg cct gcg gag gtt gac ggg Gly Gly His Ala Cys Arg Ser Asp Ala Ala Pro Ala Glu Val Asp Gly	135	140	145	150	608
gat cac gtc ccg gat gtc gtc acc gcg agc aac tcg ggg agc gtc ccg Asp His Val Pro Asp Val Val Thr Ala Ser Asn Ser Gly Ser Val Pro	155	160	165	656	
gac cgc gag agg aga gag acg acg cca tcg tcg agc cgg gcg cac ggc Asp Arg Glu Arg Arg Glu Thr Thr Pro Ser Ser Ser Arg Ala His Gly	170	175	180	704	
ggc gag ctc agc gat ctg gag tcg gat ctg gtg ggg cgg cag aag act Gly Glu Leu Ser Asp Leu Glu Ser Asp Leu Val Gly Arg Gln Lys Thr	185	190	195	752	
ggc tgc tcg tcg tcg ccg gcg aca aca aca tcg gct gcg gag ctg atc Gly Cys Ser Ser Ser Pro Ala Thr Thr Thr Ser Ala Ala Glu Leu Ile	200	205	210	800	
gtg ccg cca gca cag gag atc cag gaa ttc ttc gcg gcc gc Val Pro Pro Ala Gln Glu Ile Gln Glu Phe Phe Ala Ala	215	220	225	841	

<210> 6  
 <211> 227  
 <212> PRT  
 <213> Zea mays

<220>  
 <221> misc\_feature  
 <222> (111)..(111)  
 <223> The 'Xaa' at location 111 stands for Gln.

<400> 6

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Ser Ala Ala Ala Thr Gly Gly Gly Val Ala Lys Val Ala Pro Pro Arg  
 35 40 45

Arg Lys Lys Ala Leu Leu Pro Ala Ala Asn Val Thr Thr Ser Gly Glu  
 50 55 60

Pro Gly Ala Val Gly Ala Gly Gly Gly Asp Gly Gly Ser Cys Cys Tyr  
 65 70 75 80

Ile His Leu Arg Ser Arg Met Leu Phe Met Ala Ala Pro Gln Gln Gln  
 85 90 95

Pro Ser Ala Ala Leu Thr Pro Val Glu Ala Ala Gly Ala Ala Xaa Gln  
 100 105 110

Gly Gly Val Val Ala Leu Ala Ala Gly Leu Ser Arg Cys Ser Ser Thr  
 115 120 125

Ala Ser Ser Val Asp Val Gly Gly His Ala Cys Arg Ser Asp Ala Ala  
 130 135 140

Pro Ala Glu Val Asp Gly Asp His Val Pro Asp Val Val Thr Ala Ser  
 145 150 155 160

Asn Ser Gly Ser Val Pro Asp Arg Glu Arg Arg Glu Thr Thr Pro Ser  
 165 170 175

Ser Ser Arg Ala His Gly Gly Glu Leu Ser Asp Leu Glu Ser Asp Leu



180

185

190

Val Gly Arg Gln Lys Thr Gly Cys Ser Ser Ser Pro Ala Thr Thr Thr  
195 200 205

Ser Ala Ala Glu Leu Ile Val Pro Pro Ala Gln Glu Ile Gln Glu Phe  
210 215 220

Phe Ala Ala  
225